

DEVICE FOR THE INPUT AND READ-OUT OF DATA

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to a data input/read-out device, more particularly a tactile display, including at least one output element, more particularly a Braille element, for outputting Braille data by correspondingly changing the surface profile; and at least one input element for inputting data, the input element being positionable in at least two different positions to thus enter data; wherein the maximum spacing between the at least one input element and the at least one output element does not exceed a specific maximum value so that the input element and the output element can be touched or actuated simultaneously by one hand to trigger several different control commands independently of the position.

2. Description of Prior Art

So-called tactile displays, such as, for example, Braille script output devices, also termed Braille bars, with which blind PC users are able to read out the information contents from displays, have been known for a long time. They comprise as a rule a housing, a plurality of Braille modules arranged mostly in-line on the housing surface and several keys as well as switches serving as input elements or control pulse generators, some of which are arranged parallel to the Braille module row, on the front narrow side of the housing.

When during readout of the Braille bar a specific control information is required, this can be entered, e.g., by thumbing the corresponding control pulse generator. For this purpose the user must always leave the position attained by the reading hand when the corresponding reading position and the control pulse generator position are not located under each other, which is usually the case.

One Braille output device known in actual practice is disclosed in the prospectus "BRAILLEX 2D-Screen" of the firm F. H. Papenmeier GmbH & Co. KG, D-58239 Schwerte, Germany. Arranged on the slanted front narrow side of the low-profile housing are the various control pulse generators needed by a blind operator working with the Braille bar at the PC workstation.

This arrangement of the Braille bar and the control pulse generators arranged parallel thereto on the slanted front narrow side of the housing enables the user when reading out the Braille bar, which is done, as is known, by at least one finger tip of one hand, to actuate the control pulse generators, e.g., with the thumb, whereby in most cases the reading hand of the user must leave the attained reading position.

Another known Braille output device is disclosed in the prospectus "BRAILLEX Compact" of the same firm as stated above. Here too, in most cases, actuating the control pulse generators with the thumb on the front slanted side of the housing necessitates having to leave the respective reading position on the Braille bar.

These devices known to the practice have, however, several disadvantages:

In most cases, the user must leave the reading position he has just attained in order to thumb the control pulse generators during Braille reading. Furthermore, having to move the position of the hand or hands back and forth between Braille reading and actuating the control pulse generators requires added concentration leading to earlier tiredness and mistakes. In addition, relocating the reading position previ-

ously left takes time which has a disadvantageous effect on working efficiency.

SUMMARY OF THE INVENTION

Thus, the object of the present invention is to provide a tactile display including at least one output element, more particularly a Braille element, for outputting Braille data by correspondingly changing the surface profile; and at least one input element for inputting data, the input element being positionable in at least two different positions to thus enter data which alleviates the disadvantages listed above. More particularly, the object is to configure an input device, e.g. a control pulse generator so that it can be actuated during Braille reading in all reading positions without the reading hand or hands having to leave the respective reading position.

This is achieved in that the maximum spacing between the at least one input element and the at least one output element does not exceed a specific maximum value so that the input element and the output element can be touched or actuated simultaneously by the one hand to trigger several different control commands independently of the position, or in that the input element is formed by a control bar; the spacing between the control bar and the Braille module row is defined so that every Braille module of the row and the control bar can be simultaneously touched and thus actuated with one hand to trigger control commands independently of the position by means of the control bar.

Preferred embodiments are defined in the sub-claims.

The advantages associated with the invention are based on the following configuration of the device in accordance with the invention: The input element, which must not necessarily be configured as a single element but may, for example, consist of two or more separate elements, is arranged as regards the output elements, e.g., the Braille elements, so that the maximum spacing between the input element and the output elements does not exceed a specific maximum value, this maximum value being dimensioned so that the output element or elements can be simultaneously touched with one hand to read out information and actuate the input element without interrupting contact with the input element. The maximum value may range, e.g., from 15 to 25 cm, the preferable value being approx. 20 cm. Since the input element is configured so that the spacing to the output element(s) does not exceed a maximum value, the user of the device in accordance with the invention no longer has to remove his reading hand, resting on the output elements, from a reading position just attained so as to be able to actuate the input element. In other words, the user is now able to trigger several different control commands, independently of the position.

Due to the configuration in accordance with the invention, the input element is spaced away from every output element or only spaced away from a certain array of output elements so that when at least one hand or one finger is placed on the output elements for reading, the input element may be actuated with another finger of the same hand, e.g. the thumb, the reading finger being able to remain on the actual reading position of the output elements. Now, since there is no need to leave the reading position for actuating the input element, the user is relieved of the time-consuming task of relocating the most recent reading position. Consequently, the device in accordance with the invention considerably boosts working efficiency, thus the operation of said device is faster and more relaxing for the user. In addition, work can also be done with fewer mistakes since there are now no interruptions during reading.